## Section 4.3 – Practice Problems

1. Find the sum of the interior angles of the polygons for each number of sides.

a) 20

$(n-2)180$

$\boxed{3240^\circ}$

b) 17

$(n-2)180$

$\boxed{2700^\circ}$

c) 39

$(n-2)180$

$37 \cdot 180$

$\boxed{6660^\circ}$

d) 23

$(n-2)180$

$\boxed{3780^\circ}$

2. One interior angle of a regular polygon is given. Find the number of sides.

a) 156°

$\frac{(n-2)180}{n} = 156$

$156n = 180n - 360$

$-24n = -360$

$\boxed{n = 15}$

b) 144°

$\frac{(n-2)180}{n} = 144$

$144n = 180n - 360$

$-36n = -360$

$n = 10$

c) 160°

$\frac{(n-2)180}{n} = 160$

$160n = 180n - 360$

$-20n = -360$

$\boxed{n = 18}$

d) 179°

$\frac{(n-2)180}{n} = 179$

$179n = 180n - 360$

$-n = -360$

$\boxed{n = 360}$

3. The number of sides of a regular polygon is given. Calculate the measure of each interior angle.

a) 4

$\frac{(n-2)180}{n} = x$

$\frac{(4-2)180}{4} = x$ $\quad x = \frac{360}{4}$ $\quad \boxed{x = 90}$

b) 17

$\frac{(n-2)180}{n} = x$

$\frac{(17-2)180}{17} = x$ $\quad x = 158.8^\circ$

$\frac{15 \cdot 180}{17} = x$

c) 8

$\frac{(n-2)180}{n} = x$

$\frac{6 \cdot 180}{8} = x$ $\quad \boxed{x = 135^\circ}$

d) 13

$\frac{(n-2)180}{n} = x$

$\frac{11 \cdot 180}{13} = x$ $\quad \boxed{x = 152.3^\circ}$

4. The sum of the interior angles of a regular polygon is given. Calculate the measure of each exterior angle.

a) 2880°

$x = (n-2)180$

$2880 = (n-2)180$

$16 = n-2 \quad n = 18$

$\frac{360}{18} = 20$ $\quad \boxed{20^\circ}$

b) 1620°

$1620 = (n-2)180$

$9 = n-2 \quad n = 11$

$\frac{360}{11} = \boxed{32.72^\circ}$

c) 3780°

$3780 = (n-2)180$

$n = 23$

$\frac{360}{23} = \boxed{15.7^\circ}$

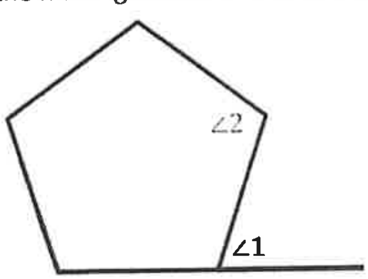
d) 3420°

$3420 = (n-2)180$

$19 = n-2 \quad n = 21$

$\frac{360}{21} = \boxed{17.1^\circ}$

5. Find the missing values for the following polygons.




$n = 5$

$\frac{(n-2)180}{n} = \angle 2$

$\angle 2 = \frac{3 \cdot 180}{5}$

$\angle 2 = 108^\circ$

$\angle 1 = 180 - 108$

$= 72^\circ$

$\angle 1 = 72^\circ$
$\angle 2 = 108^\circ$

6. If two circles have radii $8\ and\ 12$, what is the ratio of the circumferences? Areas?

$F_S : F_L$ | $P_S : P_L$ | $C_S : C_L$ | $A_S : A_L$

$8 : 12$ | $a : b$ | $2 : 3$ | $a^2 : b^2$

$2 : 3$ | $2 : 3$ | | $2^2 : 3^2 \Rightarrow 4 : 9$

$a : b$

7. If the area of two circles are $16\pi$ and $36\pi$, what is the ratio of the radii? Of the circumferences?

$A_S : A_L$ | $F_S : F_L$ | $r_S : r_L$ | $C_S : C_L$

$16\pi : 36\pi$ | $a : b$ | $a : b$ | $a : b$

$4 : 9$ | $2 : 3$ | $2 : 3$ | $2 : 3$

$2^2 : 3^2$

$a^2 : b^2$

8. Two similar cylinders have lateral (sides) surface areas of $36\pi\ and\ 64\pi$. Find the ratios of their heights.

$A_S : A_L$ | $F_S : F_L$ | $h_S : h_L$

$36\pi : 64\pi$ | $a : b$ | $a : b$

$9 : 16$ | $3 : 4$ | $3 : 4$

$3^2 : 4^2$

$a^2 : b^2$

9. Two spheres of the same density have a surface area of $16\pi cm^2$ and $36\pi cm^2$. If the small ball weigh $6kg$, what does the larger sphere weigh? V of Sphere: $\frac{4}{3}\pi r^3$

$A_S : A_L$ | $F_S : F_L$ | $V_S : V_L$

$16\pi : 36\pi$ | $a : b$ | $a^3 : b^3$

$4 : 9$ | $2 : 3$ | $2^3 : 3^3$

$2^2 : 3^2$ | | $8 : 27$

$a^2 : b^2$

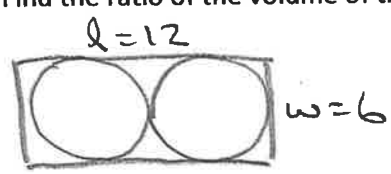
$$\frac{V_S}{V_L} = \frac{a^3}{b^3}$$

$$\frac{m_S}{m_L} = \frac{a^3}{b^3}$$

$$\frac{6\,kg}{m_L} = \frac{8}{27}$$

$m_L = 20.25$ kg

10. Two identical cylinders are tightly packed side by side in a box $12cm\ by\ 6cm$ and $4cm\ in\ height$. Find the ratio of the volume of the box to the volume of the cylinders.




h= 4 cm

$V_{box} = lwh$

$= 12(6)(4)$

$= 288\ cm^3$

$V_{cyl} = \pi r^2 h$

$= \pi (3)^2 (4)$

$= 36\pi\ cm^2$

$V_{Two\ cyl} = 2(36\pi) = 72\pi\ cm^2$

$$\frac{V_{Box}}{V_{Two\ cyl}} = \frac{288}{72\pi} = \frac{4}{\pi}$$

$= 4 : \pi$